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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/057,624	10/25/2001	James G. Shelnut	50455	2203
21874	7590	12/08/2003		
EDWARDS & ANGELL, LLP P.O. BOX 9169 BOSTON, MA 02209			EXAMINER TALBOT, BRIAN K	
			ART UNIT 1762	PAPER NUMBER

DATE MAILED: 12/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/057,624

Applicant(s)

SHELNUT, JAMES G.

Examiner

Brian K Talbot

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 8-26 and 34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 27-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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1. The amendment filed 9/24/03 has been considered and entered. Claims 1-34 remain in the application.
2. This application contains claims 8-26 and 34 are drawn to an invention nonelected with traverse in paper filed 6/11/03. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.
3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. In light of the amendment filed 9/24/03, the 35 USC 112, second paragraph rejections as well as the objection to the Title have been withdrawn. In addition, the rejection over Datta et al. (2002/0064592) has been withdrawn.
5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim Rejections - 35 USC § 103

6. Claims 1-4,6,7,27-30,32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (6,277,263) in combination with Rapoport et al. (5,298,687).

Chen (6,277,263) teaches method for electrolytically depositing copper on a semiconductor. A copper bath is utilized to electroplate copper onto a seed layer or to enhance an ultra-thin copper seed layer which has been deposited on a barrier layer by PVD. When used for seed layer enhancement, the resulting copper seed layer provides an excellent conformal copper coating that allows the microstructures to be filled with copper layer having good uniformity (see abstract). The substrate can have vias or trenches lined with a barrier layer.

Chen (6,277,263) fail to teach the use of a conductive polymer for the seed layer.

Rapoport et al. (5,298,687) teaches a multilayer interconnect system and method of manufacturing. Looking at figs. 1-2, a first metal seed layer (2) is applied to a substrate (1). Next a second seed layer (4) is applied to create a continuous seed layer prior to subsequent depositing. The seed layer is a conductive polymer (col. 3, lines 40-62).

Therefore, it would have been obvious for one skilled in the art at the time the invention was made to have modified Chen (6,277,263) seed layer with the conductive polymer as evidenced by Rapoport et al. (5,298,687) with the expectation of achieving similar results, i.e. a conformal, continuous conductive coating.

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Claims 5 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (6,277,263) in combination with either Rapoport et al. (5,298,687) further in view of Jonas et al. (6,358,437 B1) and Cloots et al (6,340,496 B1).

Chen (6,277,263) in combination with either Rapoport et al. (5,298,687) fails to teach the conductive polymer being an acetylene, aniline, pyrrole or thiopene.

Features described above are incorporated here.

Jonas et al. (6,358,437 B1) and Cloots et al (6,340,496 B1) both teach utilizing substituted conductive polythiophenes and polypyrroles for forming conductive coatings (abstract).

Therefore, it would have been obvious for one skilled in the art at the time the invention was made to have modified Chen (6,277,263) in combination with Rapoport et al. (5,298,687) conductive polymer seed layer with Jonas et al. (6,358,437 B1) and Cloots et al (6,340,496 B1) conductive polymers of polythiophenes and polypyrroles with the expectation of achieving similar success.

Response to Amendment

7. Applicant's arguments filed 9/24/03 have been fully considered but they are not persuasive.

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Applicant argued that Chen (6,277,263) fails to teach using conductive polymers and that Rapoport et al. (5,298,687) fails to teach apertures \leq to 1 micron as well as integrated circuit technology.

The Examiner agrees. In response to applicant's piecemeal analysis of the references, the rejection is not overcome by pointing out that one reference does not contain a particular limitation when reliance for that teaching is on another reference. *In Re Lyons* 150 USPQ 741 (CCPA 1966). Moreover, it is well settled that one cannot show non-obviousness by attacking the references individually where, as here, the rejection is based on combinations of the references. *In Re Keller*, 208 USPQ 871 (CCPA 1981); *In Re Young*, 159 USPQ 725 (CCPA 1968). In this case, the secondary references are relied upon for teach the conventionality of utilizing conductive polymers for enhancing seed layer deposition. With respect to the size of the aperture, it is the Examiner's position

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian K Talbot whose telephone number is (703) 305-3775. The examiner can normally be reached on Monday-Friday 6AM-3PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3775.

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A handwritten signature in black ink, appearing to read "B K Talbot", with a stylized flourish at the end.

Brian K Talbot
Primary Examiner
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BKT

December 2, 2003